REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

By the foregoing amendment, claim 1 has been amended, and new claims 9-14 have been added. Thus, claims 1-14 are currently pending in the application and subject to examination.

In the Office Action mailed April 19, 2004, the Examiner objected to claim 1. The Examiner further rejected claims 1-2 under 35 U.S.C. §103(a) as being unpatentable over Re. 31,545 to Quinn (Quinn) in view of U.S. Patent No. 4,945,263 to Estrada (Estrada). The Examiner further rejected claim 7 under 35 U.S.C. §103(a) as being unpatentable over Applicant's admitted Prior Art, in view of Quinn and Estrada. The Examiner allowed claims 3-6 and 8. Applicant acknowledges with gratitude the allowance of these claims.

Regarding the objection to claim 1, the claim has been amended responsive to the objection. Applicant respectfully submits that the amendment overcomes the objection, and accordingly, respectfully requests withdrawal of the objection.

Claim 1 stands rejected claims 35 U.S.C. §103(a) as being unpatentable over Quinn in view of Estrada. This rejection is respectfully traversed, as follows.

Claims 1 and 2 were rejected as being unpatentable over Quinn (U.S. Patent No. Re 31,545) in view of Estrada (U.S. Patent No. 4,945,263). In making this rejection, the Examiner states that it is obvious to use the resistors of Estrada in place of the voltage

source of Quinn. Applicant respectfully disagrees with this assertion, and traverses the rejection.

Applicant notes that Quinn teaches away from using resistors in place of the voltage source, for the following reasons. Even if the voltage source of Quinn is replaced with the resistors of Estrada, the resulting invention would not function properly, and would not meet the stated goals of Quinn. When a resistor is used as a current sink, if an emitter voltage of an amplifier changes in accordance with an input signal Vin, a voltage applied to the current sink resistor changes, thereby changing a current flowing through the current sink resistor. Accordingly, if a strain component is included in an input differential signal, the strain component presents on an output signal of the amplifier. Since Quinn intends to provide a high precision amplifier by reducing a strain component due to the nonlinearity of the PN junction, a current sink needs to be a constant current source. Accordingly, one skilled in the art would be dissuaded from using the resistor of Estrada in place of the constant current source of Quinn. Therefore, it would not be obvious to one skilled in the art to replace the voltage source of Quinn with the resistors of Estrada.

Furthermore, the Examiner states that the current sink is a resistor in Fig. 5 of Quinn. However, Applicant notes that the circuit of Fig. 5 of Quinn is a current source circuit, but not an amplifier, and therefore cannot be applied to the present invention.

In addition, the Examiner states that the amplifiers of Quinn are grounded emitter amplifiers. The Examiner further states that Applicant's argument that it is not possible to obtain a large output signal is not persuasive because any of the functional

statements are not included in the claims. Applicant respectfully submits that this is an inherent feature of the structure recited in claim 1. The amplifiers of Quinn are emitter coupled amplifiers, but not grounded emitter amplifiers. Furthermore, since the grounded emitter amplifiers of the present invention have resistors but do not include a constant current source, large currents can be linearly output when inputting a large input signal. Thus, since the constant current sources of Quinn's amplifiers restrict a current flowing at the time of inputting a large signal, a large output cannot be obtained relative to a large input. Accordingly, the advantage of obtaining a large output relative to a large input is an inherent feature of the structure recited in claim 1. Therefore, obtaining a large output relative to a large input is a feature of claim 1, and is not obtained from the amplifiers of Quinn. For this reason, claim 1 is patentable over the art of record.

Furthermore, the Examiner states that single-end configuration amplifiers are common emitter amplifiers and are disclosed as transistors of Quinn. Applicant respectfully traverses this assertion. The amplifiers of Quinn are a differential circuit and differentially operate in response to a single-end input. In contrast, since the single-end differential amplifiers of the present invention are grounded emitter amplifiers, an amplifier where an input signal is applied only operates in response to a single-end input. Accordingly, Quinn does not teach the single-end configuration amplifiers of the present invention. For this reason, claim 1 is patentable over the art of record.

Regarding claim 2, this claim is dependent on claim 1 and presents further features of the invention. Claim 2 is patentable for at least the reasons discussed

above in reference to claim 1. Accordingly, withdrawal of the rejection of claim 2 is respectfully requested.

New claims 9 and 12 each include the limitation that the emitter of the first transistor and the emitter of the second transistor are not directly connected to each other, which distinguishes over the circuit of Quinn because the emitters thereof are directly connected to each other via resistors.

New claims 10 and 13 each include the limitations that cross-coupling improves the balance of the first and second output signals and using the first and second grounded emitter amplifiers improves linearity of the first and second output signals, which distinguish over the circuit of Quinn because it is not configured to have such a feature.

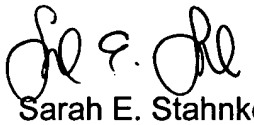
New claims 11 and 14 each include the limitation that each of the grounded emitter amplifiers and the grounded base amplifier has a base for receiving an input signal, which distinguishes over the circuit of Quinn because the bases of the transistor of Quinn only receive an input signal.

Should the Examiner believe the application is not in condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, Applicant respectfully petitions for an appropriate extension of time. The Commissioner is authorized to charge payment for any additional fees which may be required with respect to this paper to Counsel's Deposit Account 01-2300.

Respectfully submitted,

Arent Fox, PLLC



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Enclosure: Petition for Extension of Time